

WHAT IS CLAIMED IS:

1. Labelling apparatus for use with a conveyor for conveying products in a downstream direction, comprising:

- a vision system for imaging products on said conveyor;
- a plurality of labellers downstream of said vision system, each labeller for being fixed above said conveyor at a different transverse position over said conveyor;
- a processor for, responsive to an input from said vision system, selecting a labeller to label a given product and sending an activation signal to one said labeller.

2. The labelling apparatus of claim 1 further comprising:

- a conveyor position indicator,
- and wherein said processor is also responsive to said conveyor position indicator for timing sending said activation signal.

3. The labelling apparatus of claim 2 wherein said vision system is for imaging an area, said area having an extent at least as large as a tray on said conveyor for a group of said products.

4. The labelling apparatus of claim 1 wherein said each labeller is a tamping labeller.

5. The labelling apparatus of claim 4 wherein each said labeller comprises at least one flexible bellows having a retracted position and an extended tamping position.

6. The labelling apparatus of claim 5 further comprising an air diffuser associated with each bellows, each air diffuser extending interiorly of an associated bellows from a base of said associated bellows toward a tamping end of said associated bellows.

7. The labelling apparatus of claim 6 wherein said each air diffuser comprises a central opening facing said tamping end of said associated bellows and at least one side opening facing a side of said associated bellows.

8. The labelling apparatus of claim 7 further comprising an air blocking member associated with said associated bellows for blocking said central opening of said each air diffuser when said associated bellows is in said retracted position.

9. The labelling apparatus of claim 8 wherein each said labeller has a first airway for communicating a negative air pressure to said air diffuser in order to retract said associated bellows to said retracted position and a second airway for communicating a positive pressure to said air diffuser in order to extend said associated bellows.

10. The labelling apparatus of claim 9 wherein said tamping end of said each bellows has perforations such that when a negative pressure is communicated to said each bellows, there is a negative pressure in a vicinity of said tamping end of said each bellows for holding a label on said tamping end.

11. The labelling apparatus of claim 10 wherein said air blocking member comprises a one-way valve at said tamping end of said each bellows, said one-way valve for closing in the presence of positive pressure air from said air diffuser and for opening in the presence of negative pressure air from said air diffuser.

12. The labelling apparatus of claim 11 wherein said one-way valve comprises a disc positioned interiorly of said bellows and attached medially to said tamping end of said bellows.

13. The labelling apparatus of claim 10 further comprising a stationary cylindrical core having said first airway and said second airway and a rotatable annular sleeve carried on said core, said sleeve having said air diffuser and said each bellows.

14. The labelling apparatus of claim 13 wherein said first airway comprises a channel extending along a substantial portion of a periphery of said stationary core and wherein said second airway comprises a slot in said periphery of said stationary core spaced from either end of said channel by a land.

15. The labelling apparatus of claim 13 further comprising a stepper motor for driving a two-sided timing belt and a releasable mount for a label web cassette, said label web cassette having a drive pinion, said drive pinion for meshingly engaging with said two-sided timing belt when said label web cassette is mounted to said releasable mount.

16. The labelling apparatus of claim 15 wherein said stepper motor steps in response to an activation signal from said processor.

17. The labelling apparatus of claim 15 wherein said label web has a pin hole between each label and wherein said label web cassette has a pin wheel operatively connected to said drive pinion.

18. The labelling apparatus of claim 17 further comprising a ratchet tooth fixed in relation to a pin of said pin wheel and a pawl setting a limit for said stepper motor when operated in a label web retracting direction whereby said label web may be retracted so that a label is at a pre-determined start position.

19. A method of labelling products, comprising:

conveying products in a downstream direction;

determining a target area for a given product on said conveyor relative to a frame of reference and activating a one of a plurality of labellers positioned above said conveyor at fixed transverse positions which one labeller is within a transverse extent of said target area.

20. The method of labelling products of claim 19 further comprising:

timing said activating based on a position of said conveyor.

21. The method of claim 20 wherein said determining comprises imaging a tray on said conveyor holding a group of said products.

22. The method of claim 21 wherein said determining determines a target area relative to said frame of reference for each product of said group of products on said tray.

23. A computer readable medium which when loaded into a processor of a labelling apparatus, causes said processor to:

determine a target area for a given product on said conveyor relative to a frame of reference; and

send an activation signal to a one of a plurality of labellers positioned above said conveyor at fixed transverse positions which one labeller is within a transverse extent of said target area.

24. A product labelling apparatus comprising:

at least one flexible bellows having a retracted position and an extended tamping position;

an air diffuser associated with each bellows, each air diffuser extending interiorly of an associated bellows from a base of said associated bellows toward a tamping end of said associated bellows, said each air diffuser having a central opening facing said tamping end of said associated bellows and at least one side opening facing a side of said associated bellows.

25. The labelling apparatus of claim 24 further comprising an air blocking member associated with said associated bellows for blocking said central opening of said each air diffuser when said associated bellows is in said retracted position.

26. The labelling apparatus of claim 24 further comprising a stationary disc-shaped core having a first airway and a second airway and a rotatable annular sleeve carried on said core, said sleeve having said air diffuser and said at least one bellows.

27. The labelling apparatus of claim 26 wherein said first airway comprises a channel extending along a substantial portion of a periphery of said stationary core and wherein said second airway comprises a slot in said periphery of said stationary core spaced from either end of said channel by a land.

28. A labelling apparatus comprising:

an indexing turret carrying a plurality of tamping labellers;

a stepper motor for stepping in synchronism with step-wise movement of said turret,
said stepper motor for driving a two-sided timing belt;

a releasable mount for a label web cassette;

said label web cassette having a drive pinion, said drive pinion for meshingly engaging with said two-sided timing belt when said label web cassette is mounted to said releasable mount.

29. A labelling apparatus comprising:

an indexing turret carrying a plurality of tamping labellers;

a label web cassette normally driven in synchronism with said indexing turret;

wherein a label web of said cassette has a pin hole between each label and wherein said label web cassette has a driven pin wheel engaging said pin holes; and

a ratchet tooth fixed in relation to a pin of said pin wheel and a pawl setting a limit for driving said label web cassette in a label web retracting direction whereby said label web may be retracted so that a label is at a pre-determined start position.

30. Labelling apparatus, comprising:

a conveyor for conveying products in a downstream direction;

a vision system for imaging products on said conveyor;

a plurality of labellers downstream of said vision system, each labeller fixed above said conveyor at a different transverse position;

a processor for, responsive to an input from said vision system, determining a transverse position of a given product and sending an activation signal to one said labeller closest to said determined transverse position.